

REMARKS

The present application has claims 1, 3-5, 9-12 and 15-19 pending. Applicants have herein above amended claim 1 slightly to improve its clarity. Support for the amendment may be found on page 5, lines 21-22, of the specification. No new matter has been introduced by the amendment.

In the June 17, 2008 Office Action, the Examiner rejects the claims 1-5, 9-13 & 15-19 as obvious to one of ordinary skill in the art over Fischer (DE 196 11 510) in view of Goller et al. (US Patent 4,185,131) and further in view of Campbell et al. (US Patent Pub. 2001/0009733). Applicants disagree.

From the text of the Office Action, it does not appear that the Examiner has fully considered Applicants' last response. Initially, Applicants point out that in the June 17th Office Action the Examiner discusses and specifically rejects claims 2 and 13 - although claim 2 was canceled in Applicants' February 19, 2008 response and claim 13 was canceled in Applicants' June 11, 2007 response. Additionally, on page 4, third paragraph, the Examiner argues that the limitation in claims 1, 2, 15 and 19 - regarding the organic solvent being present between 1 and 50 weight % of water - is obvious in light of the cited references. The limitation, however, was no longer present in the claims - having been amended to 5 to 25%.

Moreover, and more importantly, the Examiner appears to have a misunderstanding with respect to the present invention. On page 4, the Examiner argues that it would have been obvious to combine the cited references "in order to improve dispersion capabilities of the catalytic ink" (lines 3-4, emphasis added). Again, at line 19, page 4, the Examiner asserts that "[t]he skilled artisan recognizes that the amount of water directly affects the dispersion ability of the ionomer in the ink" (emphasis added).

Dispersion capability, however, is not the object of the present invention. As discussed in Applicants' last response (see, e.g., page 5), the present invention is directed to improving the adhesion of the catalyst layer -- not the dispersion capabilities of the catalytic ink or the dispersion ability of the ionomer in the ink.

The present invention provides an ink for producing catalyst and electrode layers with improved adhesion, better electrical performance and improved screen life (see, for instance, specification, page 4, lines 11-14). The inventors of the present invention discovered that an ink containing substantially water as a solvent has surprisingly good adhesion to the polymer membrane, among other properties, when the ink contains preferably 5 to 25 wt. % of a solvent from a group of linear dialcohols (see page 5, line 19-23).

The discovery that the adhesion quality of electrode/catalyst layers may be improved by means of controlling the ratio of linear dialcohol solvent vs. the total water content of the ink is novel and surprising, and certainly not obvious from the cited Fischer, Goller or Campbell references.

These references fail to disclose or teach a water-based ink composition that contains an aqueous solution of an ionomer, and a solvent which is substantially water with 5 to 25 wt. % of a co-solvent from a group of linear dialcohols with a flash point higher than 100 °C, as required by amended claim 1. Moreover, none of the cited references, either alone or in combination, suggest that adhesion of the electrode/catalyst layers made from water-based inks may be improved by the use of a solvent which is substantially water with 5 to 25 wt. % of a co-solvent from the group of specified linear dialcohols.

Fischer discloses inks where the organic solvent is the major solvent component of the inks -- unlike that of the present invention where water is the major solvent component. Furthermore, Fischer does not teach that specific water to organic solvent ratios improve adhesion of electrode/catalyst layers made from the ink.

Likewise, Goller is silent to the use of water as an ink solvent and to specific water to organic solvent ratios in order to improve adhesion of electrode/catalyst layers made from the ink.

Campbell is not directed to catalyst inks, and does not disclose specific compositions or weight ratios. In particular, Campbell is silent to the use of organic solvents and to the use of specific water to organic solvent ratios in the ink to improve adhesion of electrode/catalyst layers made from the ink.

In light of the fact that each of the cited references fail to disclose or teach the ink composition of the presently pending claims and fail to teach or suggest that specific water to organic solvent ratios can improve adhesion of electrode/catalyst layers made from the ink, Applicants maintain that the present obviousness rejections are improper.

Applicants would also like to point out another misstatement regarding the subject invention in the June 17th Office Action, with respect to the Examiner's response to Applicants' last amendment. On page 5 of the Office Action ("Response to Arguments" section), the Examiner states that Applicants contend the cited references "do not teach an aqueous ink with a composition of 1 to 25 wt.% of water" (emphasis added).

This is incorrect. Applicants claim an ink with a composition of 5 to 25 wt.% of **organic solvent based on the water content of the ink**, and contend that the cited references do not teach such ink. Applicants do not claim an ink with a composition of 1

to 25 wt.% of water (nor 5 to 25 wt. % of water). It is not the amount of water that is important to the present invention, but rather the organic solvent content of the ink. Applicants have herein amended claim 1 to present this point with more clarity.

Consequently, the Examiner's conclusion that it would have been obvious "to employ said water concentration" (page 5, lines 8-9, emphasis added) does not have bearing on the patentability of the present invention. Likewise, the Examiner's assertion that a "skilled artisan recognizes that the amount of water directly affects the dispersion ability of the ionomer in the ink" (page 5, lines 11-12, emphasis added) does not relate to the subject invention.

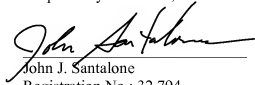
In view of the above arguments and amendments, Applicants respectfully request that the rejections set forth in the June 17th Office Action be withdrawn and that the application be deemed in condition for allowance.

No additional fee is believed to be due with respect to the filing of this reply, other than the fee for a three month extension of time and the fee for the accompanying RCE, which Applicants are concurrently filing with the present response. If any fee is due, please charge our Deposit Account No. 11-0171 for such sum.

Applicant: STARZ, et al.
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If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John J. Santalone", is written over a horizontal line.

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